Name STURMAN key
Period

DIMENSIONAL ANALYSIS AND SIG FIG Practice TEST

*Convert the following measurements and put in correct scientific notation form. Show work and please box your answers.

1) $3.45 \times 10^{-8}\ \mu m^3$ to km^3

$3.45\times10^{-17} \times 10^{-18}$ $-17+18=-35$

$$\frac{3.45\times10^{-8}\ \mu m^3}{1}\cdot\frac{1\ m}{10^6\ \mu m}\cdot\frac{1\ m}{10^6\ \mu m}\cdot\frac{1\ m}{10^6\ \mu m}\cdot\frac{10^{-3}\ km}{1\ m}\cdot\frac{10^{-3}\ km}{1\ m}\cdot\frac{10^{-3}\ km}{1\ m}=\frac{3.45\times10^{-17}}{10^{18}}=\boxed{3.45\times10^{-35}\ km^3}$$

2) 56789.003 Mg/cm^3 to dg/dm^3

$$\frac{56789.003\ Mg}{cm^3}\cdot\frac{10\ cm}{1\ dm}\cdot\frac{10\ cm}{1\ dm}\cdot\frac{10\ cm}{1\ dm}\cdot\frac{1\ g}{10^{-6}\ Mg}\cdot\frac{10\ dg}{1\ g}=56789.003\times10^{4}\times10^{6}=5.6789.003\times10^{10}$$

$$=\boxed{5.6789003\times10^{14}\ \frac{dg}{dm^3}}$$

3) $10.78 \times 10^{9}\ kgm/s^2$ to $gcm/\mu s^2$

$$\frac{10.78\times10^{9}\ kg\ m}{1\ s^2}\cdot\frac{1\ g}{10^{-3}\ kg}\cdot\frac{10^{2}\ cm}{1\ m}\cdot\frac{1\ s}{10^{6}\ \mu s}\cdot\frac{1\ s}{10^{6}\ \mu s}=10.78\times10^{11}\times10^{-9}=10.78\times10^{2}=\boxed{1.078\times10^{3}\ \frac{g\,cm}{\mu s^2}}$$

4) 9.87×10^{-10} kL to cm^3

$$\frac{9.87\times10^{-10}\ kL}{1}\cdot\frac{1\ L}{10^{-3}\ kL}\cdot\frac{10^{3}\ mL}{1\ L}\cdot\frac{1\ cm^3}{1\ mL}=9.87\times10^{-7}\times10^{3}=\boxed{9.87\times10^{-4}\ cm^3}$$

5) Which is more time, 3.45×10^{-3} Ms or 1.98×10^{5} ms?

$$\frac{3.45\times10^{-3}\ Ms}{1}\cdot\frac{1\ s}{10^{-6}\ Ms}=3.45\times10^{-3}\times10^{6}$$

$$=3.45\times10^{3}\ s=3450\ s$$

$$\frac{1.98\times10^{5}\ ms}{1}\cdot\frac{1\ s}{10^{3}\ ms}=1.98\times10^{2}\ s$$

$$=198\ s$$

6) Find the volume of a piece of iron, in cm^3, if its density is 7.7 kg/m^3 and its mass is 10.9 kg.

$V = ?\ cm^3$

$\rho = 7.7\ kg/m^3$

$m = 10.9\ kg$

$$\frac{7.7\ kg}{1\ m^3}=\frac{10.9\ kg}{V\ m^3}$$

$7.7V = 10.9$

$V = 1.4155\ldots$

$= 1.4\ m^3$

$$\frac{1.4\ m^3}{1}\cdot\frac{10^{2}\ cm}{1\ m}\cdot\frac{10^{2}\ cm}{1\ m}\cdot\frac{10^{2}\ cm}{1\ m}$$

$$=\boxed{1.4\times10^{6}\ cm^3}$$

7) How many microseconds in 2.3×10^{2} years?

$$\frac{2.3\times10^{2}\ yr}{1}\cdot\frac{365.25\ days}{1\ yr}\cdot\frac{24\ hr}{1\ day}\cdot\frac{60\ min}{1\ hr}\cdot\frac{60\ sec}{1\ min}\cdot\frac{1\times10^{6}\ \mu sec}{1\ sec}=\boxed{7.3\times10^{15}\ \mu s}$$

8) State the number of significant digits in the following measurements and under line the digits that are significant.

8 a. 0.00076890000g

1 b. 5000m/s

4 c. $5.000 \times 10^{4}\ \mu m$

5 d. $3.0123\ km^2$

9) Find the area and circumference of a circular rodeo ring if its ~~radius~~ diameter is 200.0m. Include units, round to the correct # of sig figs and use the π button on your calculator.

πr^2

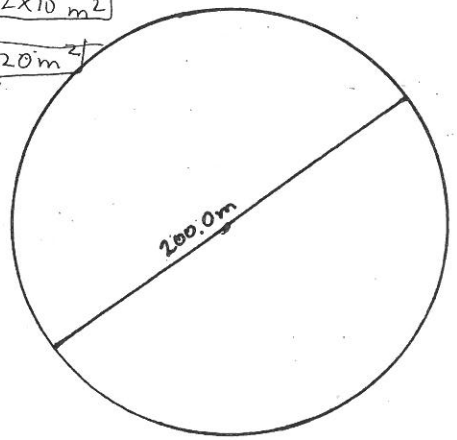
$2\pi r$

Area: $\pi(100.0^2) = 31415.9$ → $3.142\times10^{4}\ m^2$ → $31420\ m^2$

Circumference: $6.283\times10^{2}\ m$

100.0

6.283



Practice TEST